IN THE CLAIMS

1. (Currently Amended) A prosthesis adapted for implantation against a resected surface on a proximal end of a femur and inside of an intramedullary cavity of the femur, the prosthesis comprising:

a femoral head component ~~having~~ comprising an external bearing surface ~~and a female friction fit portion~~; and

a femoral stem component comprising:

a neck portion ~~having~~ comprising a proximal ~~male friction fit~~ portion, ~~reversibly~~ engagable with the ~~female friction fit portion~~femoral head component, and a distal neck body;

a flange portion distal and adjacent to the neck portion, ~~attached to the distal neck body, having~~ the flange portion comprising ~~an upper portion and~~ a bottom surface;

a transitional body region~~,~~ adjacent to the bottom surface of the flange portion and extending from the distal neck body; and

an elongated stem portion extending distally from the transitional body region and having a longitudinal axis ~~that is orientated~~oriented at an acute angle from the bottom surface of the flange portion;~~ and~~

~~a distal end tip portion adjacent and distal to the elongated stem portion;~~

wherein the transitional body region ~~has a maximum height of less than thirteen millimeters when measured normal from the bottom surface of the flange to any part of the elongated stem portion~~is shaped to flex such that, during a normal gait cycle, the bottom surface exerts a significant compressive load on the resected surface of the femur.

2. (Original) A prosthesis as is claim 1, wherein the elongated stem portion comprises a uniform envelope with a substantially constant cross-sectional peripheral shape and size.

3. (Currently Amended) A prosthesis as in claim 1, wherein the elongated stem portion comprises a proximal section having a cross sectional shape that is substantially consistent along a longitudinal length of the proximal section, wherein a minimum displacement between the bottom surface of the flange and the proximal section, measured normal to the bottom surface, is less than thirteen millimeters.~~whereby some of the forces applied to the head component during use are converted into displacement of the flanged portion and compressive forces to the calcar region of the femur through the surface on the femur.~~

4. (Original) A prosthesis as in claim 1, further comprising a rotation-restricting boss, extending from the bottom of the flange portion.

5. (Original) A prosthesis as in claim 2, further comprising a rotation-restricting boss, extending from the bottom of the flange portion.

6. (Currently Amended) A prosthesis as in claim 5, wherein the rotation restricting boss has an axis of protrusion with a boss axis origin near the bottom surface of the flange, the elongated stem also has a stem axis origin near the bottom of the flange, the boss axis origin and the stem axis origin are spaced apart by a length more than the maximum cross-section of the elongated stem portion.

7. (Original) A prosthesis as in claim 6, wherein the axis of protrusion and the longitudinal axis are substantially parallel.

8. (Original) A prosthesis as in claim 6, wherein the axis of protrusion and the longitudinal axis are not substantially parallel.

9. (Currently Amended) A prosthesis as in claim 6, wherein the axis of protrusion is normal to the bottom surface of the flange portion.

10. (Currently Amended) A prosthesis as in ~~Claim~~ claim 1, wherein the elongated stem portion has a distal section with multiple longitudinal flutes, wherein the longitudinal flutes are aligned approximately parallel to the longitudinal axis.

11. (Cancelled)

12. (Currently Amended) A prosthesis as in ~~Claim~~ claim 1, wherein the neck portion is aligned at an obtuse angle with respect to the bottom surface of the flange portion.

13. (Currently Amended) A prosthesis as in ~~Claim~~ claim 12, wherein the obtuse angle is between 100° and 170°.

14. (Currently Amended) A prosthesis as in ~~Claim~~ claim 1, wherein the neck portion has a first end and a second end, wherein the first end is connected to the flange portion and ~~extending~~ extends proximally therefrom~~;~~ and the second end is shaped to press-fit into ~~a~~ the femoral head component.

15. (Currently Amended) A prosthesis as in ~~Claim~~ claim 14, wherein at least a portion of the outer surface of the femoral head component is hemispherical.

16. (Currently Amended) A prosthesis as in clam 1, wherein the acute angle ranges from 15° to 80°.

17. (Currently Amended) A prosthesis as in claim 2, wherein the uniform envelope has a maximum cross-section area measured on a plane perpendicular to the longitudinal axis.

18. (Currently Amended) A prosthesis as in claim 1, wherein the elongated stem portion has a length of at least one hundred millimeters as measured along the length of its longitudinal axis.

19. (Cancelled)

20. (Currently Amended) A prosthesis as in claim 1, wherein ~~having a tapered portion within~~ the elongated stem portion comprises a tapered portion.

21-39. (Cancelled)

40. (Currently Amended) A prosthesis adapted for implantation against a resected surface on a proximal end of a femur and inside of a cavity of the femur, comprising:

a femoral head component ~~having~~ comprising an external bearing surface~~ and a female friction fit portion~~; and

a femoral stem component comprising:

a neck portion shaped to extend~~ing~~ substantially outside the cavity of the femur, the neck portion ~~and~~ having a proximal ~~male friction fit~~ portion, ~~reversibly~~ engagable with the ~~female friction fit portion~~femoral head component, and a distal neck body; ~~extending distal and lateral to the male friction fit portion:~~

a flange portion medially and distally projecting from the neck body, the flange portion comprising ~~having an upper portion and~~ a bottom surface;

an elongated stem portion shaped to extend~~ing~~ substantially inside the cavity of the femur and extending distally from the neck body and having a longitudin~~g~~al axis ~~that is orientated~~oriented at an acute angle from the bottom surface of the flange portion; ~~and~~

~~a distal tip portion adjacent and distal to the elongated stem portion;~~

wherein, distally of a medial tip of the flange, each cross sectional shape along substantially an entire length of the elongated stem portion ~~has~~ is substantially radially symmetrical~~an outer surface that is substantially circumscribed by a surface of revolution~~.

41. (Currently Amended) A prosthesis adapted for implantation against a resected surface on a proximal end of a femur and inside of a cavity of the femur, comprising:

a femoral head component ~~having~~ comprising an external bearing surface~~ and a female friction fit portion~~; and

a femoral stem component comprising:

a neck portion shaped to extend~~ing~~ substantially outside the cavity of the femur, the neck portion ~~and~~ having a proximal ~~male friction fit~~ portion, ~~reversibly~~ engagable with the ~~female friction fit portion~~femoral head component, and a distal neck body; ~~extending distal and lateral to the male friction fit portion:~~

a flange portion medially and distally projecting from the neck body, the flange portion comprising ~~having an upper portion and~~ a bottom surface;

an elongated stem portion shaped to extend~~ing~~ substantially inside the cavity of the femur and extending distally from the neck body and having a longitudingal axis ~~that is orientated~~oriented at an acute angle from the bottom surface of the flange portion;~~ and~~

~~a distal tip portion adjacent and distal to the elongated stem portion;~~

wherein, distally of a medial tip of the flange, substantially an entire length of the elongated stem portion ~~has an outer surface that~~ is ~~substantially~~ circumscribed by a ~~surface with a substantially uniform cross section~~substantially cylindrical shape.

42. (Currently Amended) A prosthesis adapted for implantation against a resected surface on a proximal end of a femur and inside of a cavity of the femur, comprising:

a femoral head component ~~having~~ comprising an external bearing surface ~~and a female friction fit portion~~; and

a femoral stem component comprising:

a neck portion shaped to extend~~ing~~ substantially outside the cavity of the femur, the neck portion ~~and~~ having a proximal ~~male friction fit~~ portion, ~~reversibly~~ engagable with the ~~female friction fit portion~~femoral head component, and a distal neck body; ~~extending distal and lateral to the male friction fit portion:~~

a flange portion medially and distally projecting from the neck body, the flange portion comprising ~~having an upper portion and~~ a bottom surface;

an elongated stem portion shaped to extend~~ing~~ substantially inside the cavity of the femur and extending distally from the neck body and having a longitudin~~g~~al axis ~~that is orientated~~oriented at an acute angle from the bottom surface of the flange portion; ~~and~~

~~a distal tip portion adjacent and distal to the elongated stem portion;~~

wherein, distally of a medial tip of the flange, any two maximum cross sectional widths of the elongated stem portion, measured perpendicular to the longitudinal axis, ~~does not vary~~ do not differ ~~in its maximum cross sectional width~~ by more than ten percent.

43. (New) A prosthesis as in claim 1, wherein the elongated stem portion comprises a proximal section having a cross sectional shape that is substantially consistent along a longitudinal length of the proximal section, wherein a minimum displacement between the bottom surface of the flange and the proximal section, measured normal to the bottom surface, is less than a maximum cross sectional width of the elongated stem portion, measured perpendicular to the longitudinal axis.

44. (New) A prosthesis as in claim 1, wherein the transitional body region is shaped to provide a lateral offset between an axis of the neck portion and the longitudinal axis of the elongated stem portion.

45. (New) A prosthesis as in claim 40, wherein, distally of a medial juncture of the neck portion with the flange, each cross sectional shape along substantially the entire length of the elongated stem portion is substantially radially symmetrical.

46. (New) A prosthesis as in claim 40, wherein each cross sectional shape is selected from the group consisting of a circle, a rectangle, a triangle, a hexagon, and a star shape.

47. (New) A prosthesis as in claim 40, wherein the elongated stem portion comprises a proximal section having a substantially circular shape, and a distal section having a non-circular cross sectional shape.

48. (New) A prosthesis as in claim 40, wherein, distally of a medial tip of the flange, substantially an entire length of the elongated stem portion is circumscribed by a substantially cylindrical shape.

49. (New) A prosthesis as in claim 48, wherein, distally of a medial tip of the flange, any two maximum cross sectional widths of the elongated stem portion, measured perpendicular to the longitudinal axis, do not differ by more than ten percent.

50. (New) A prosthesis as in claim 40, wherein the femoral stem component further comprises a transitional body region adjacent to the bottom surface of the flange portion, wherein the transitional body region is shaped to provide a lateral offset between an axis of the neck portion and the longitudinal axis of the elongated stem portion.

51. (New) A prosthesis as in claim 41, wherein, distally of a medial juncture of the neck portion with the flange, substantially the entire length of the elongated stem portion is circumscribed by the substantially cylindrical shape.

52. (New) A prosthesis as in claim 41, wherein the elongated stem portion comprises a proximal

section having a substantially circular shape, and a distal section having a non-circular cross sectional shape.

53. (New) A prosthesis as in claim 41, wherein, distally of a medial tip of the flange, any two maximum cross sectional widths of the elongated stem portion, measured perpendicular to the longitudinal axis, do not differ by more than ten percent.

54. (New) A prosthesis as in claim 41, wherein the femoral stem component further comprises a transitional body region adjacent to the bottom surface of the flange portion, wherein the transitional body region is shaped to provide a lateral offset between an axis of the neck portion and the longitudinal axis of the elongated stem portion.

55. (New) A prosthesis as in claim 42, wherein, distally of a medial juncture of the neck portion with the flange, any two maximum cross sectional widths of the elongated stem portion, measured perpendicular to the longitudinal axis, do not differ by more than ten percent.

56. (New) A prosthesis as in claim 42, wherein the elongated stem portion comprises a proximal section having a substantially circular shape, and a distal section having a non-circular cross sectional shape.

57. (New) A prosthesis as in claim 42, wherein the femoral stem component further comprises a transitional body region adjacent to the bottom surface of the flange portion, wherein the transitional body region is shaped to provide a lateral offset between an axis of the neck portion and the longitudinal axis of the elongated stem portion.